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Java169 Preface to Image Processing
This is the Preface page for a book titled Image Processing using Java.

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Preface

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Java170-Graphics-Introduction to Images
This lesson provides an introduction to the handling of images in Java, including sample programs that illustrates some of the methods used to display an image in a Frame object. It is being included in the sub-collection titled Processing Image Pixels solely as background technical information.

Note:
Revised: 01/12/16
This page is included in the following books:

- Image Processing using Java
- Java Graphics

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Java174-Graphics-Overview of Advanced Image Processing Capabilities

This lesson presents a cursory overview of the advanced image processing capabilities of Java. It is being included in the sub-collection titled Processing Image Pixels solely as background technical information.

Note:
Revised: 01/12/16
This page is included in the following books:

- Image Processing using Java
- Java Graphics

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Java400-Processing Image Pixels using Java, Getting Started
Prof. Baldwin shows you how to modify an image by modifying the pixels belonging to that image. He also provides a driver program that makes it easy to modify the pixels in an image and to display the modified image.

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Java402-Processing Image Pixels using Java, Creating a Spotlight

Prof. Baldwin shows you how to control the brightness of pixels in an image. As an example, he shows you how to create a spotlight that lights up the center of an image leaving the outer edges dark.

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Java404-Processing Image Pixels Using Java Controlling Contrast and Brightness

Prof. Baldwin shows you how to control the contrast and brightness of an image by controlling the distribution of the color pixels. He provides and explains a Java program that can be used to experiment interactively with image contrast and brightness.

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Java406-Processing Image Pixels, Color Intensity, Color Filtering, and Color Inversion

Learn to write a Java program to control color intensity, apply color filtering, and apply color inversion to an image. Learn to relate the colors to points on a color wheel and points in a color cube.

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Preface

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Java408-Processing Image Pixels, Performing Convolution on Images
Learn to write Java programs that use convolution (flat filters and Gaussian filters) to smooth or blur an image. Also learn how to write jpg files containing specialized images that are useful for testing image-processing programs.

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Java410-Processing Image Pixels, Understanding Image Convolution in Java

Learn how and why image convolution works by examining the changes to the wave-number spectrum produced by image convolution. Also learn how to write the code for a general purpose image-convolution class in Java.

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Java412 Processing Image Pixels, Applying Image Convolution in Java, Part 1

This is Part 1 of a two-part lesson on image convolution. In this lesson, I will walk you through several experiments intended to help you understand why and how image convolution does what it does. I will also show you how to design and implement several types of convolution filters

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Java414 Processing Image Pixels, Applying Image Convolution in Java, Part 2

This is Part 2 of a two-part lesson. In the two parts of this lesson, I have provided you with a general purpose image convolution program. In addition, I have walked you through several experiments intended to help you understand why image convolution does what it does.

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Java416 Processing Image Pixels, An Improved Image-Processing Framework in Java

Learn about a new image processing framework that provides the ability to perform two sequential processes on an image, to display the modified images resulting from each process, (in addition to the original image), and to write the modified images into output files in JPEG format.

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- File: Java416 .htm
- Published: 01/03/16

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Java418 Processing Image Pixels, Creating Visible Watermarks in Java
Learn how to write a Java program that can be used to add five different types of visible watermarks to an image.

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Java450 A Framework for Experimenting with Java 2D Image-Processing Filters

Learn about the image-filtering classes of the Java 2D API. Also learn how to write a framework program that makes it easy to use those image-filtering classes to modify the pixels in an image and to display the modified image.

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Java452 Using the Java 2D LookupOp Filter Class to Process Images
Learn how to write programs that use the LookupOp image-filtering class of the Java 2D API for a variety of image-processing purposes.

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Java454 Using the Java 2D AffineTransformOp Filter Class to Process Images

Learn how to write programs that use the AffineTransformOp image-filtering class of the Java 2D API for a variety of image-processing purposes.

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Java456 Using the Java 2D LookupOp Filter Class to Scramble and Unscramble Images

Learn how to use the LookupOp image-filtering class from the Java 2D API, along with the Random class from the java.util package to write a pair of easy-to-use programs to scramble and unscramble images in a reasonably secure fashion.

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Java458 Using the Java 2D BandCombineOp Filter Class to Process Images

Learn how to write programs that extract Raster objects from an image and then use the BandCombineOp image-filtering class of the Java 2D API for a variety of image-processing purposes.

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Java460 Using the Java 2D ConvolveOp Filter Class to Process Images

Learn how to write programs that use the ConvolveOp class of the Java 2D API to perform two-dimensional image convolution. Also learn about some of the weaknesses of the ConvolveOp class that result from a lack of options for dealing with convolution output values greater than 255 and less than 0.

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Java462 Using the Java 2D ColorConvertOp and RescaleOp Filter Classes to Process Images

Learn how to write programs that use the RescaleOp and ColorConvertOp classes of the Java 2D API to perform a variety of filtering operations on images.

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Preface

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Java340 Getting Started
Learn how to download, install, and test a Java multimedia library developed by Mark Guzdial and Barbara Ericson at Georgia Tech. Also learn how to download, install, and test a lightweight Java IDE named DrJava, which has the ability to interactively evaluate Java code.

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Java342 Getting Started with the Turtle Class

Learn about the behavior of the Turtle class, and start learning about the behavior of its superclass named SimpleTurtle.

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Java344 Continuing with the SimpleTurtle Class

Learn how the World class and the Turtle class of the multimedia library implement a practical version of the Model-View-Control programming paradigm. Investigate the differences between placing a turtle in a world and placing a turtle in a picture.

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Java346 Wrapping Up the SimpleTurtle Class
Learn more about the methods and the properties of a Turtle object from Ericson's Java multimedia library.

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Java348 The Pen and PathSegment Classes

Learn about the Pen and PathSegment classes in Ericson's multimedia library, which are critical to maintaining a complete history of the turtle's movements.

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- File: Java348 .htm
- Published: 01/04/16

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Java349 A Pixel Editor Program in Java

Examine a new program written entirely in Java that you can use to edit the pixels in your digital photos on a pixel-by-pixel basis

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Preface

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Java350 3D Displays, Color Distance, and Edge Detection

Learn about color distance, projecting 3D coordinates onto a 2D display plane, and edge detection. Understanding these concepts will help you to better understand modern image processing.

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Java351 A Slider-Controlled Softening Program for Digital Photos
Learn how to write a Java program to apply a blurring or softening filter to your digital photos The amount of softening is controlled by the user with a slider.

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Java352 Adding Animated Movement to Your Java Application

Learn how to add animated movement into your program where multiple objects chase a lead object as it moves randomly in a given environment.

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Java353 A Slider-Controlled Sharpening Program for Digital Photos

Learn how to write a Java program to apply a sharpening filter to your digital photos. The amount of sharpening is controlled by the user with a slider.

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Java354 The DigitalPicture Interface
Learn how to write programs using the methods defined in the Picture and SimplePicture classes that are declared in the DigitalPicture interface.

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Java355 The HSB Color Model

Develop both a technical and an intuitive understanding of the HSB color model, which is closer to the way we think and talk about color than the RGB color model.

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Java356 The show Method and the PictureFrame Class

Learn how the show() method of the Picture class causes the image contained in a Picture object to be displayed on the screen in a JFrame object. Also learn about the PictureFrame class, which serves as an intermediary between the Picture object and the JFrame object.

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Java357 An HSB Color-Editing Program for Digital Photos
Learn more about the HSB color model and how to use that model to adjust the hue, saturation, and brightness of your digital photos.

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Java358 Applying Affine Transforms to Picture Objects
Learn how to scale, rotate, and translate Picture objects.

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Java359 Creating a lasso for editing digital photos in Java
Learn how to write the code to use the mouse to create a lasso on an image in Java. This capability is critical to the editing of digital photos.

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Java360 Wrapping Up the SimplePicture Class

Learn how to cause two or more pictures to have the same width or the same height and otherwise maintain their individual aspect ratios, how to create composite pictures containing side-by-side images, how to draw text on a picture, and how to apply the same operation to every pixel in a Picture object.

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Java361 A Temperature and Tint Editing Program for Digital Photos
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Miscellaneous

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- File: Java361.htm
- Published: 01/04/16

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Java362 Getting Started with the PictureExplorer Class

Learn about a picture explorer class that allows you to determine the numeric color values for any pixel in a picture by placing a cursor on the pixel. The pixel position is controlled by clicking or dragging the mouse within the picture, clicking buttons, or typing coordinate values. You can also zoom in and out to view the pixel in more or less detail, and you can see the actual color of the pixel in a large square.

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Java363 Redeye Correction in Digital Photographs
Learn how to write a Java program that can be used to correct for redeye problems in digital photographs.

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Java364 Building the Information Panel for the PictureExplorer GUI
Learn how to construct a complex panel and add it to a JFrame, including event registration using anonymous listener classes, BoxLayout, and resource loading via the Class class.

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Java365 Using Flood-Fill in Java Programs
The text for this lesson is incomplete. However, I am publishing the source code for the program in case you find it useful.

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Java366 Displaying an Image in a PictureExplorer Object
Learn the final details of what you will need to incorporate objects of the PictureExplorer class into applications of your own design.

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Java2700 Changing the Default Background Image for a World

Learn how to modify Ericson's World class, causing it to accept the name of an image file as a parameter to the constructor. The image from the file replaces the default white background of the world object.

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